

**This Page Is Inserted by IFW Operations  
and is not a part of the Official Record**

## **BEST AVAILABLE IMAGES**

**Defective images within this document are accurate representations of the original documents submitted by the applicant.**

**Defects in the images may include (but are not limited to):**

- **BLACK BORDERS**
- **TEXT CUT OFF AT TOP, BOTTOM OR SIDES**
- **FADED TEXT**
- **ILLEGIBLE TEXT**
- **SKEWED/SLANTED IMAGES**
- **COLORED PHOTOS**
- **BLACK OR VERY BLACK AND WHITE DARK PHOTOS**
- **GRAY SCALE DOCUMENTS**

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**

Remarks:

Reconsideration of the application is requested.

Claims 1-15 are now in the application. Claims 1-10 and new claim 15 are subject to examination. Claims 11-14 have been withdrawn from examination.

Applicants affirm their telephonic provisional election, with traverse, to prosecute the invention of Group II, claims 1-10. New claim 15 is directed to the apparatus of Group II and should be examined with the other claims of that Group.

In item No. 6 on page 3 of the above-identified Office Action, claim 6 has been rejected as being indefinite under 35 U.S.C. § 112, second paragraph.

More specifically, the Examiner states that he does not understand the phrase "thickness decreasing with an increasing distance from the substrate." The Examiner's objection is not fully understood, since this feature of the preferred embodiment is disclosed in detail on page 7, lines 4-12 and on page 14, lines 7-22 of the instant specification.

Claim 6 has been amended to recite that the "insert" has a portion of its surface on which the substrate is to be mounted and that the thickness of the layer decreases with distance

away from the portion. This language more clearly sets forth the arrangement of the preferred embodiment and is believed to address the Examiner's comments. Support for this change is found at the above-mentioned locations on pages 7 and 14 of the instant specification.

Accordingly, applicants believe that claim 6 now meets the requirements of 35 U.S.C. § 112, second paragraph. The above noted change to claim 6 is provided solely for the purpose of clarification and cosmetic reasons. The change is neither provided for overcoming the prior art nor does it narrow the scope of the claim for any reason related to the statutory requirements for a patent.

In item 8 on page 3 of the above-identified Office Action, claims 1-4 and 7-10 have been rejected as being unpatentable over Kobayashi et al. (JP 02-248393) in view of Holcombe et al. (US 5,443,892) under 35 U.S.C. § 103(a).

As will be explained below, it is believed that the claims were patentable over the cited art in their original form and, therefore, the claims have not been amended to overcome the references.

According to a preferred embodiment, the metal carbide layer formed on the portion of the insert surface where the

substrate is to be mounted has the advantage of preventing contaminating material from diffusing onto the substrate. Also, this arrangement provides the advantage of reducing the production costs of the parts that come into contact with the wafer/substrate.

The Kobayashi et al. reference discloses a susceptor for a vapor growth device, containing a carbon main body 11 and carbon insertion members 12 for carrying samples 20. The main body has holes for holding the insertion members.

The Holcombe et al. reference discloses graphite articles, such as crucibles 10, for use in high temperature metallurgical processes. The articles are provided with a multiple-layer coating 14 for inhibiting carbon diffusion from the graphite into the molten metal. The innermost layer 16 is made from a "carbide-forming metal" with a thickness adequate to intercept carbon diffusing from the graphite crucible during the melting operations. The intercepted carbides are converted to carbides within the metal layer. The next innermost layer 18 is formed of a metal-refractory oxide. The third layer 20 also is formed of a ceramic or refractory metal oxide.

Clearly, Kobayashi et al. do not disclose or teach providing a metal carbide layer or coating of a particular thickness on a

portion of the surface of the insert as recited in claim 1 of the instant application.

The Examiner has proposed to make up for the deficiency of Koyabashi et al. by combining it with Holcombe et al. Applicants submit that such a combination of references is improper and not supported by the teachings and disclosures of either of these references as discussed below. Further, applicants submit that such a combination is based solely on hindsight and, even if proper, would not result in the claimed invention for reasons discussed below. A person skilled in the art would not combine these references for the basic reason that Kobayashi et al. pertains to a susceptor for a CVD device, i.e., a device operating with gaseous components, and Holcombe et al., on the contrary, pertains to a device for a metallurgic process with melted metal (see the Abstract, and/or col. 1, lines 10-12). Kobayashi et al. and Holcombe et al. thus describe devices for clearly different processes. Absent hindsight, without reference to the specification and claims of the instant application, a person having ordinary skill in the art to which the invention pertains would not have extracted an isolated teaching from a reference in the metallurgical field (i.e., Holcombe et al.) and applied it to a device in a totally unrelated field for a CVD gaseous process as described in Kobayashi et al.

Furthermore, even if a combination of these references was considered proper, which it is not, the combination would not result in the claimed preferred embodiment, because the crucible disclosed in Holcombe et al. does not have a surface containing "a metal carbide layer of a given thickness forming at least a portion" of the insert surface as recited in claim 1. On the contrary, Holcombe et al. describe a coating of the graphite crucible with a multi-layer configuration. At least three layers are provided (see the Abstract, col. 2, lines 50-65, col. 4, lines 1-8, as well as the wording of claim 1). In particular, the second and third layers are made from a high-melting metal oxide or a ceramic. They are not materials that would be considered a "metal carbide layer" as set forth in claim 1 of the instant application. A person skilled in the art would not discern from the teachings and disclosure of Holcombe et al. that the second and third layers could be omitted without impairing the quality of the invention disclosed in Holcombe et al. The teachings of Holcombe et al. would not make any sense without the second and third layers. The device would then no longer be a multi-layer configuration. According to the teaching of Holcombe et al., the device must contain at least three layers, two of which contain materials that are not metal carbide layers as recited in claim 1 of the instant application.

Further, the material of the first layer, i.e. the layer which is applied immediately on the graphite body in Holcombe et al., is not metal carbide. This layer is a carbide-forming metal (see the Abstract, col. 2, line 59, col. 4, lines 4 and 48, as well as claim 1 in col. 9, line 14). A carbide-forming metal is not the same as the "metal carbide layer" recited in claim 1 of the instant application. Although the metal applied in Holcombe et al. has the characteristic of being able to form a metal carbide, it is not applied as carbide. Holcombe et al. do not disclose or teach that a metal carbide layer is formed from the carbide-forming metal during the metallurgic processes. Regardless, even if in individual cases some carbide formation takes place within the metal layer, it still essentially remains a metal layer.

In item 9 on page 3 of the above-identified Office Action, claims 1-4, 7, and 9-10 have been rejected as being unpatentable over Kobayashi et al. (JP 02-248393) in view of Yamaga et al. (US 5,614,447) under 35 U.S.C. § 103(a).

The Yamaga et al. reference discloses a method for heat treating a semiconductor substrate 1, an impurity implantation region 2 where impurities are implanted on the surfaces of the substrates, a susceptor 3 adjacent one side of region 2, a protection plate 4 adjacent a far side of substrate 1, and an absorbing film 5 for infrared rays coated on the susceptor and protection plate. The film may be a carbon film.

The combination of the Kobayashi et al. and Yamaga et al. is considered to be improper for the reasons discussed below.

In Yamaga et al., a layer which absorbs infrared rays is applied on a base body, either a susceptor or a protective plate (see Abstract, or col. 4, lines 15-25). The susceptor as well as the protective plate are of a material selected from the group of gallium nitride, aluminum nitride and boron nitride (see Abstract, col. 4, lines 17 and 20, as well as all four claims). The coating is carbon or a metal carbide. In Yamaga et al., the coating exclusively serves the purpose of absorbing infrared rays (see col. 5, line 57 to col. 6, line 3). A person of ordinary skill in the art would have provided such a coating in Kobayashi et al. only if he had considered an improvement of the absorption of infrared rays to be technically necessary. This, however, is surely not the case, because Kobayashi et al. use carbon which already has good absorption of infrared rays. Yamaga et al. also preferably use carbon for the coating (see, for example, col. 5, line 58). An additional metal carbide coating would thus not have been necessary in Kobayashi et al., only for the purpose of improving the absorption behavior of infrared rays. The coating in Yamaga et al. is clearly necessary because the nitride material which is used for the susceptor and for the protective plate does not have a sufficient absorption



behavior. This behavior is already very good in Kobayashi et al., because of the carbon that is used.

The metal carbide coating provided according to the preferred embodiment was not provided for the purpose of improving the absorption of rays, but instead for the purpose of preventing contamination of the substrate (for example, see page 5, lines 9 and 10 of the instant specification). Both objectives clearly are distinctly different from each other. The objective of the preferred embodiment, namely, to prevent contamination of the substrate when it is mounted in place on the insert surface, is not at all disclosed or taught in Kobayashi et al. or in Yamaga et al. The only basis for combining these references is hindsight.

In item 10 on page 4 of the above-identified Office Action, claim 5 has been rejected as being unpatentable over Kobayashi et al. in view of Holcombe et al. as applied to claim 1 and further in view of Drage (US 4,793,975) and Doi et al. (US 4,507,189) under 35 U.S.C. § 103(a).

The Drage reference discloses a plasma reactor having a lower electrode assembly containing a lower electrode 10 with an annular depression 11 which defines a central pedestal 12 for receiving a semiconductor wafer. A ring 13 having a central aperture 14 overlies the pedestal. A raised portion 15 surrounds the aperture and serves to locate a wafer directly

above the pedestal at the approximate center of the plasma chamber.

The Doi reference discloses a process of physical vapor deposition for coating hard compounds on the surface of cutting tools or other parts requiring wear and/or heat resistance. The hard compound may be a carbide.

The combination of Kobayashi et al. and Holcombe et al. as applied to these claims is believed to be improper for the same reasons advanced above relative to claim 1 from which claim 5 depends. Further, the use of the Druge and Doi references to make up for the deficiencies of Kobayashi et al. and Holcombe et al. also is improper. The plasma reactor of Druge and the vapor deposition process of Doi have absolutely no relation to each other or to the disclosures of the primary references, Kobayashi et al. and Holcombe et al., cited against these claims. In order to reject these claims, the Examiner has compiled a piecemeal reconstruction of the prior art based purely on hindsight. Essentially, after becoming aware of the claimed preferred embodiment, the Examiner has sought various isolated teachings and disclosures in the prior art to arrive at the claimed embodiment. It is submitted that there is no logical basis for the proposed combination of these references.

A critical step in analyzing the patentability of claims pursuant to 35 U.S.C. § 103 is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. See In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614,1617 (Fed. Cir. 1999). Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher." Id. (quoting W.L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983)).

Most if not all inventions arise from a combination of old elements. See In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1453,1457 (Fed. Cir. 1998). Thus, every element of a claimed invention may often be found in the prior art. See id. However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. See id. Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the appellant. See In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 163.5, 1637 (Fed. Cir. 1998);

In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125,1127 (Fed. Cir. 1984).

The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved. See Dembiczak, 175 F.3d at 999, 50 USPQ2d at 1617. In addition, the teaching, motivation or suggestion may be implicit from the prior art as a whole, rather than expressly stated in the references. See WMS Gaming, Inc. v. International Game Tech., 184 F.3d 1339, 1355, 51 USPQ2d 1385, 1397 (Fed. Cir. 1999). The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art. See In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981) (and cases cited therein). Whether the examiner relies on an express or an implicit showing, the examiner must provide particular findings related thereto. See Dembiczak, 175 F.3d at 999, 50 USPQ2d at 1617. Broad conclusory statements standing alone are not "evidence." Id. When an examiner relies on general knowledge to negate patentability, that knowledge must be articulated and placed on the record. See In re Lee, 277 F.3d 1338, 1342-45, 61 USPQ2d 1430, 1433-35 (Fed. Cir. 2002).

Upon evaluation of the Examiner's comments contained in the above-identified Office Action, it is respectfully believed that the evidence adduced by the Examiner is insufficient to establish a prima facie case of obviousness with respect to the claims of the instant application. Accordingly, the Examiner is requested to withdraw the rejection.

New claim 15 recites that the metal carbide layer is in direct proximity with the substrate to prevent contamination of the substrate when mounted thereon. Support for this feature is found on page 7, lines 4-10 of the instant specification.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art. The dependent claims 2-10 and 15 are believed to be patentable as well, because they all are ultimately dependent on claim 1.

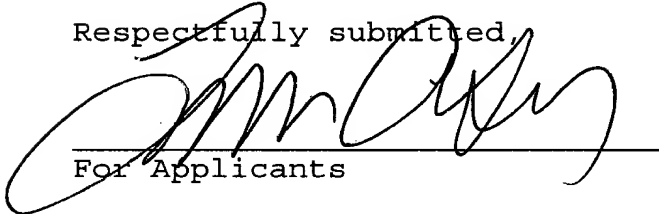
Finally, applicants appreciatively acknowledge the Examiner's statement that "claim 6 would be allowable if rewritten to overcome the rejection under 35 U.S.C. sec. 112, second paragraph...and to include all of the limitations of the base claim (1) and any intervening claims." While applicants believe that claim 6 now overcomes the Examiner's rejection,

in view of the above comments, applicants respectfully believe that rewriting of claim 6 is unnecessary at this time.

In view of the foregoing, reconsideration and allowance of claims 1-15 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out.

Respectfully submitted,



For Applicants

LAURENCE A. GREENBERG  
REG. NO. 29,308

FDP/tk

December 11, 2002

Lerner and Greenberg, P.A.  
Post Office Box 2480  
Hollywood, FL 33022-2480  
Tel: (954) 925-1100  
Fax: (954) 925-1101



Version With Markings to Show Changes Made:

Claim 6 (Amended). The device according to claim 1, wherein

said portion of said surface serves for mounting the

substrate, and said given thickness of said metal carbide

layer decreases with an increasing distance from [the

substrate] said portion of said surface.